

EXHIBIT 84
FILED UNDER SEAL

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

WAYMO LLC,)
Plaintiff,)
vs.) Case No.:
UBER TECHNOLOGIES, INC.,) 3:17-cv-00939-WHA
OTTOMOTTO LLC; OTTO TRUCKING)
LLC,)
Defendants.)
_____)

CONFIDENTIAL - ATTORNEYS' EYES ONLY

VIDEOTAPED DEPOSITION OF MICHAEL LEBBY

San Francisco, California

Monday, April 17, 2017

Volume 1

Reported by:

RACHEL FERRIER, CSR No. 6948

Job No. 2596388

PAGES 1 - 80

Page 1

<div>1 UNITED STATES DISTRICT COURT</div> <div>2 NORTHERN DISTRICT OF CALIFORNIA</div> <div>3 SAN FRANCISCO DIVISION</div> <div>4 _____</div> <div>5 WAYMO LLC,)</div> <div>6 Plaintiff,)</div> <div>7 vs.)Case No.:</div> <div>8 UBER TECHNOLOGIES, INC.,)3:17-cv-00939-WHA</div> <div>9 OTTOMOTTO LLC; OTTO TRUCKING)</div> <div>10 LLC,)</div> <div>11 Defendants.)</div> <div>12 _____)</div> <div>13</div> <div>14</div> <div>15</div> <div>16 VIDEOTAPED DEPOSITION OF MICHAEL LEBBY,</div> <div>17 VOLUME 1, taken on behalf of the Plaintiff, at</div> <div>18 Quinn Emanuel Urquhart & Sullivan, LLP, 50 California</div> <div>19 Street, 22nd Floor, San Francisco, California, beginning</div> <div>20 at 1:03 p.m. and ending at 3:12 p.m. on Monday,</div> <div>21 April 17, 2017, before RACHEL FERRIER, Certified</div> <div>22 Shorthand Reporter No. 6948.</div> <div>23</div> <div>24</div> <div>25</div> <div>Page 2</div>	<div>1 APPEARANCES (continued):</div> <div>2</div> <div>3 For Defendants:</div> <div>4 MORRISON & FOERSTER, LLP</div> <div>5 BY: DANIEL MUINO</div> <div>6 Attorney at Law</div> <div>7 2000 Pennsylvania Avenue, NW, Suite 6000</div> <div>8 Washington, D.C. 20006</div> <div>9 202.887.1501</div> <div>10 dmuino@mofo.com</div> <div>11</div> <div>12</div> <div>13 Also Present:</div> <div>14 MICHAEL FOOR, Videographer</div> <div>15</div> <div>16</div> <div>17</div> <div>18</div> <div>19</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div> <div>Page 4</div>
<div>1 APPEARANCES:</div> <div>2</div> <div>3 For Plaintiff:</div> <div>4 QUINN EMANUEL URQUHART & SULLIVAN LLP</div> <div>5 BY: JARED NEWTON</div> <div>6 Attorney at Law</div> <div>7 777 6th Street NW, 11th Floor</div> <div>8 Washington, D.C. 20001</div> <div>9 202.538.800</div> <div>10 jnewton@quinnemanuel.com</div> <div>11 and</div> <div>12 QUINN EMANUEL URQUHART & SULLIVAN LLP</div> <div>13 BY: DAVID PERLSON</div> <div>14 Attorney at Law</div> <div>15 50 California Street, 22nd Floor</div> <div>16 San Francisco, California 94111</div> <div>17 415.875.6600</div> <div>18 davidperlson@quinnemanuel.com</div> <div>19</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div> <div>Page 3</div>	<div>1 INDEX</div> <div>2</div> <div>3 WITNESS EXAMINATION</div> <div>4 MICHAEL LEBBY</div> <div>5 VOLUME 1</div> <div>6 BY MR. NEWTON 7</div> <div>7</div> <div>8</div> <div>9 EXHIBITS</div> <div>10 NUMBER DESCRIPTION PAGE</div> <div>11</div> <div>12 Exhibit 30 Declaration of Michael</div> <div>13 Lebbby 8</div> <div>14 Exhibit 31 Dr. Lebbby's Curriculum</div> <div>15 Vitae 8</div> <div>16 Exhibit 32 List of Materials Considered 8</div> <div>17 Exhibit 33 Excerpt of the textbook</div> <div>18 "Packaging of High Power</div> <div>19 Semiconductor Lasers" 51</div> <div>20 Exhibit 34 Excerpts from the</div> <div>21 Dissertation of Christian</div> <div>22 Sholz 57</div> <div>23 Exhibit 35 U.S. Patent No. 4,244,109 67</div> <div>24 Exhibit 36 German Patent No. DE 3031103 70</div> <div>25 Exhibit 37 U.S. Patent No. 4,432,037 74</div> <div>26</div> <div>27</div> <div>Page 5</div>

<p>1 A That is correct. 01:44:38</p> <p>2 Q So that's not something you considered as part of 01:44:39</p> <p>3 your declaration? 01:44:44</p> <p>4 A That is correct. I did not consider that. 01:44:45</p> <p>5 Q Turning to paragraph 30 of your declaration, 01:44:47</p> <p>6 Exhibit 30, here your declaration is discussing -- 01:45:03</p> <p>7 discussing Waymo trade secrets that you characterize as 01:45:16</p> <p>8 the "six-board arrangement"; is that fair? 01:45:19</p> <p>9 A Yeah, in line 13, I characterize Way's -- Waymo's 01:45:21</p> <p>10 system as [REDACTED] Yes, that's 01:45:27</p> <p>11 correct. 01:45:30</p> <p>12 Q You understand that what you have characterized 01:45:30</p> <p>13 as [REDACTED] covers two distinct trade 01:45:32</p> <p>14 secrets from Waymo's trade secret list; correct? 01:45:35</p> <p>15 A I've written on line 10, that covers created 01:45:38</p> <p>16 Secrets No. 2 and 3. 01:45:42</p> <p>17 I believe that's the one you are talking about; 01:45:49</p> <p>18 right? 01:45:52</p> <p>19 Q Correct. 01:45:52</p> <p>20 Is it your opinion that both Trade Secret Nos. 2 01:45:54</p> <p>21 and 3 are directed to [REDACTED] 01:45:56</p> <p>22 [REDACTED] 01:45:59</p> <p>23 [REDACTED] 01:46:02</p> <p>24 [REDACTED] 01:46:06</p> <p>25 A I don't recall exactly what's written in the 01:46:07</p> <p style="text-align: right;">Page 34</p>	<p>1 a fashion where there is [REDACTED] of the boards 01:47:56</p> <p>2 and [REDACTED] of the boards. 01:47:59</p> <p>3 Q And that's the same for each cavity; correct? 01:48:02</p> <p>4 A Yes. So for the long-range cavity, a similar 01:48:07</p> <p>5 situation occurs where there are [REDACTED] lasers, and the 01:48:10</p> <p>6 lasers are distributed. 01:48:14</p> <p>7 I believe, in this case, [REDACTED] 01:48:18</p> <p>8 [REDACTED] if I 01:48:22</p> <p>9 remember correctly. 01:48:27</p> <p>10 Q So, again, the Fuji device, overall, [REDACTED] total 01:48:27</p> <p>11 lasers? 01:48:31</p> <p>12 A If you add the two cavities together, [REDACTED] lasers 01:48:32</p> <p>13 per cavity, the Fuji device has [REDACTED] lasers. 01:48:38</p> <p>14 Q You agree the design files for the transmit 01:48:42</p> <p>15 boards in the Fuji system are labeled [REDACTED] 01:48:51</p> <p>16 correct? 01:48:53</p> <p>17 A Yeah. 01:48:53</p> <p>18 If you take the medium-range cavity, you will 01:48:57</p> <p>19 find that the -- the boards -- and I'm looking at 01:49:00</p> <p>20 page 7, paragraph 25 of my declaration. You will see 01:49:04</p> <p>21 boards labeled [REDACTED] for the medium-range cavity, 01:49:08</p> <p>22 and they are labeled [REDACTED] for the long-range 01:49:11</p> <p>23 cavity. 01:49:14</p> <p>24 Q They are not labeled [REDACTED] and then [REDACTED] 01:49:14</p> <p>25 again; correct? 01:49:18</p> <p style="text-align: right;">Page 36</p>
<p>1 Trade Secrets 2 or 3, but given that I've written it 01:46:09</p> <p>2 down in my declaration, that's my understanding. 01:46:13</p> <p>3 Q You agree that the Fuji device has 64 laser 01:46:15</p> <p>4 diodes on [REDACTED] transmit boards; is that fair? 01:46:29</p> <p>5 A The Fuji device is a different device. It has 01:46:33</p> <p>6 [REDACTED] boards per cavity. It has two cavities. So the 01:46:37</p> <p>7 Fuji device is -- is different compared to the Waymo 01:46:41</p> <p>8 device. [REDACTED] Fuji is 01:46:45</p> <p>9 composed of two cavities, each cavity having [REDACTED] 01:46:49</p> <p>10 boards. 01:46:53</p> <p>11 Q Looking at the Fuji device overall, you agree 01:46:53</p> <p>12 there's [REDACTED] transmit boards? 01:46:56</p> <p>13 A The Fuji device has [REDACTED] boards for medium-range 01:47:02</p> <p>14 cavity and [REDACTED] boards for a long-range cavity. If you 01:47:09</p> <p>15 want to sum the number of boards together, there are [REDACTED] 01:47:12</p> <p>16 boards, but there are two cavities and has two different 01:47:16</p> <p>17 designs, and each cavity has [REDACTED] boards, so the way I 01:47:21</p> <p>18 look at this is [REDACTED] boards per cavity. 01:47:24</p> <p>19 Q Each of those [REDACTED] boards has [REDACTED] laser 01:47:27</p> <p>20 diodes; correct, in the Fuji device? 01:47:35</p> <p>21 A The Fuji device, if you are talking about one 01:47:37</p> <p>22 cavity, one cavity -- let's take the medium-range cavity 01:47:43</p> <p>23 has [REDACTED] boards. On the [REDACTED] boards, we have a total 01:47:48</p> <p>24 of [REDACTED] lasers. 01:47:50</p> <p>25 My understanding is the lasers are distributed in 01:47:52</p> <p style="text-align: right;">Page 35</p>	<p>1 A They are labeled [REDACTED] for medium range and [REDACTED] 01:49:19</p> <p>2 [REDACTED] for long-range. 01:49:23</p> <p>3 Q Okay. Other than the Fuji device, is the only 01:49:23</p> <p>4 other LiDAR device that you considered in connection 01:49:32</p> <p>5 with your declaration -- strike that. 01:49:35</p> <p>6 Other than the Fuji device, is the only other 01:49:39</p> <p>7 LiDAR device with [REDACTED] that 01:49:42</p> <p>8 you considered in connection with your declaration the 01:49:51</p> <p>9 Waymo GBR3 device? 01:49:53</p> <p>10 MR. MUINO: Objection to the form of the 01:50:04</p> <p>11 question. 01:50:05</p> <p>12 THE WITNESS: Could you restate the question a 01:50:06</p> <p>13 different way? 01:50:08</p> <p>14 MR. NEWTON: Sure. 01:50:09</p> <p>15 Q Other than GBR3 and the Fuji device, your 01:50:09</p> <p>16 declaration does not identify any other LiDAR systems 01:50:12</p> <p>17 that [REDACTED] 01:50:14</p> <p>18 [REDACTED] 01:50:19</p> <p>19 A I believe the answer is correct. I didn't see 01:50:20</p> <p>20 other [REDACTED]-channel units that had [REDACTED] 01:50:22</p> <p>21 [REDACTED]. 01:50:28</p> <p>22 Q If you look at paragraph 31, the Velodyne HDL 64 01:50:32</p> <p>23 LiDAR system, this is one of the ones you considered as 01:50:37</p> <p>24 part of your declaration? 01:50:40</p> <p>25 A It is my understanding that the Velodyne has 64 01:50:41</p> <p style="text-align: right;">Page 37</p>

<p>1 channels -- or let's say it's 64 lasers. 01:50:52</p> <p>2 Q And in the Velodyne system, each of those 64 01:50:58</p> <p>3 lasers is on its own transmit PCB; is that correct? 01:51:04</p> <p>4 A I don't know the actual layout of the Velodyne 01:51:07</p> <p>5 system other than what I've seen in the '190 patent, 01:51:11</p> <p>6 which is the Velodyne patent, and -- in the '190 patent, 01:51:15</p> <p>7 there are 32 transmit boards and 32 receive boards. The 01:51:19</p> <p>8 patent discusses one laser per board, but it also 01:51:27</p> <p>9 discusses a potential for two lasers per board, so I 01:51:30</p> <p>10 don't know if the '190 patent is related to the HDL 64 01:51:33</p> <p>11 or not. 01:51:37</p> <p>12 Q Okay. Fair enough. 01:51:37</p> <p>13 You agree that one possible arrangement of the 01:51:41</p> <p>14 LiDAR device with 64 lasers is one laser per board? 01:51:44</p> <p>15 A Yeah. Hypothetically, yes, you could have 64 01:51:48</p> <p>16 lasers, each having one laser per board. Yes, that is 01:51:51</p> <p>17 one hypothetical situation. 01:51:56</p> <p>18 Q And another one would be 21 or 22 laser diodes on 01:51:58</p> <p>19 three boards? 01:52:03</p> <p>20 A Yeah. That is another configuration that is 01:52:04</p> <p>21 possible too, yes. 01:52:15</p> <p>22 Q Another configuration is 16 laser diodes on four 01:52:16</p> <p>23 boards? 01:52:21</p> <p>24 A Yeah. There is -- there are a number of 01:52:24</p> <p>25 different ways you can break up 64 lasers. As you say, 01:52:30</p> <p style="text-align: right;">Page 38</p>	<p>1 PCBs was limited by well-known design considerations for 01:53:59</p> <p>2 automotive LiDARs. 01:54:00</p> <p>3 Do you see that? 01:54:01</p> <p>4 A I do see that. 01:54:02</p> <p>5 Q Do you know when Waymo first decided to develop a 01:54:03</p> <p>6 64-laser LiDAR system? 01:54:07</p> <p>7 A It may have been in some of the documents I've 01:54:08</p> <p>8 read, but I don't recall any dates to give you an answer 01:54:27</p> <p>9 to that question. 01:54:30</p> <p>10 Q Does [REDACTED] sound approximately right? 01:54:31</p> <p>11 A I probably need to look at the documents. I 01:54:35</p> <p>12 don't recall that level of detail. 01:54:40</p> <p>13 Q Okay. So assuming it would be [REDACTED], what 01:54:41</p> <p>14 I want to get at is that your declaration mentions 01:54:49</p> <p>15 this -- this point where Waymo had decided to develop a 01:54:52</p> <p>16 64-laser LiDAR; is that correct? 01:54:55</p> <p>17 A I certainly mentioned, on line 24 on page 8, that 01:54:57</p> <p>18 Waymo decided to develop a 64-laser LiDAR, yes. 01:55:04</p> <p>19 Q Okay. And regardless of whether that was [REDACTED] 01:55:07</p> <p>20 [REDACTED] or another time, your declaration doesn't cite any 01:55:12</p> <p>21 independent evidence to show that there were well-known 01:55:16</p> <p>22 design considerations for automotive LiDARs at that 01:55:18</p> <p>23 time; is that fair? 01:55:21</p> <p>24 A Well, considerations for LiDARs are -- as far as 01:55:23</p> <p>25 I can tell, from reading the documents I've seen, you 01:55:33</p> <p style="text-align: right;">Page 40</p>
<p>1 you could have 64 lasers on 64 boards at one extreme, 01:52:35</p> <p>2 and the other extreme, you could have one board with 64 01:52:39</p> <p>3 lasers on it. 01:52:42</p> <p>4 Both of those situations are, from my standpoint, 01:52:43</p> <p>5 problematic from an engineering perspective, and there 01:52:49</p> <p>6 are certainly other configurations that you just 01:52:52</p> <p>7 mentioned. 01:52:55</p> <p>8 Q Would you agree that an eight-by-eight 01:52:55</p> <p>9 arrangement would be less problematic from an 01:52:57</p> <p>10 engineering standpoint? 01:53:00</p> <p>11 A I haven't seen all the engineering parameters. 01:53:01</p> <p>12 You know, when you are designing an engineering 01:53:08</p> <p>13 system, it's not just the number of boards or the optics 01:53:10</p> <p>14 or the lasers or the photodetectors. You have to look 01:53:13</p> <p>15 at the cost of the unit, and you have to look at the 01:53:16</p> <p>16 size considerations, and you also have to look at things 01:53:18</p> <p>17 like thermal loaded, as well as yield of the lasers once 01:53:22</p> <p>18 you put them down onto the boards. 01:53:28</p> <p>19 These engineering considerations have to be taken 01:53:30</p> <p>20 into effect, and I don't believe I've been exposed to 01:53:33</p> <p>21 all those details at this time. 01:53:36</p> <p>22 Q Okay. In paragraph 32 of your declaration, you 01:53:39</p> <p>23 say: Once Waymo had decided to develop a 64-laser 01:53:44</p> <p>24 LiDAR, its range of choices for how many transmit PCBs 01:53:49</p> <p>25 to use and how to distribute the laser diodes across the 01:53:53</p> <p style="text-align: right;">Page 39</p>	<p>1 know, one of the industry-leading LiDARs at the time was 01:55:38</p> <p>2 the Velodyne, and the Velodyne, as we said earlier, had 01:55:40</p> <p>3 one laser per board. The '190 patent shows 32 boards on 01:55:44</p> <p>4 one side for the laser and 32 boards on the other side 01:55:50</p> <p>5 for the photodetector. It's my understanding that the 01:55:53</p> <p>6 alignment of the boards was actually difficult and 01:55:55</p> <p>7 time-consuming. 01:55:59</p> <p>8 And so I don't know the details of the design 01:56:00</p> <p>9 team's work here, but certainly from my perspective, you 01:56:05</p> <p>10 would want to look for easier ways to align the 01:56:09</p> <p>11 channels. 01:56:12</p> <p>12 Q Okay. And you didn't cite the Velodyne patent as 01:56:13</p> <p>13 a specific example of a well-known design consideration 01:56:20</p> <p>14 for automotive LiDAR? 01:56:24</p> <p>15 A It's not cited in paragraph 32, but I believe it 01:56:25</p> <p>16 may be cited elsewhere. I've actually cited it in 01:56:29</p> <p>17 paragraph 38. So the patent has been cited in my 01:56:41</p> <p>18 declaration. 01:56:47</p> <p>19 Q Right. 01:56:47</p> <p>20 But not cited to say that here's an example of a 01:56:48</p> <p>21 well-known design consideration for automotive LiDARs; 01:56:53</p> <p>22 is that fair? 01:56:57</p> <p>23 A Yeah, I think that's probably a fair comment, 01:56:58</p> <p>24 looking at what I've written in paragraph 32. I do not 01:57:14</p> <p>25 go into details about well-known design considerations 01:57:22</p> <p style="text-align: right;">Page 41</p>

1 not be ideal for automotive LiDARs due to size 02:05:07	1 Q You have to account for with more boards? 02:08:01
2 considerations; correct? 02:05:11	2 A Well, physical alignment, and will the boards 02:08:03
3 A Size considerations is one of the issues if you 02:05:11	3 stay in alignment over the course of a lifetime of the 02:08:07
4 had 64 lasers on a board, but the other thing you would 02:05:16	4 LiDAR. 02:08:10
5 have to be careful of is these laser are high-power 02:05:21	5 Q So in terms of the alignment, both physical and 02:08:10
6 lasers, and so there's going to be thermal effects, and 02:05:25	6 optical, more boards probably means more complexity? 02:08:13
7 the thermal effects will translate into board warpage, 02:05:28	7 A Well, the way I would look at this is if you have 02:08:18
8 and if the board warps, then everything goes out of 02:05:33	8 more boards, then your testing and alignment costs are 02:08:21
9 alignment, so not only is it a size issue, it's a 02:05:36	9 going to go higher. If you have one board, your 02:08:26
10 thermal issue and, I would say, may even be a 02:05:38	10 alignment cost is going to go down, but then you have 02:08:29
11 manufacturing yield issue, because you are going to get 02:05:41	11 the problem of large size thermal loading and warpage of 02:08:32
12 64 lasers dye bonded to the board all perfectly, and 02:05:45	12 the board to go out of alignment. 02:08:38
13 there is, you know, reasonable chance that one of them 02:05:49	13 So in both extremes, from an engineering 02:08:40
14 may not yield right, and that would add cost to the 02:05:51	14 standpoint, you may run into problems. 02:08:43
15 board for rework. 02:05:55	15 Q Okay. 02:08:45
16 Q Okay. So focusing just on size -- and that's 02:05:56	16 A Is it possible to take a break? 02:08:49
17 what I believe paragraph 33 of your declaration 02:06:10	17 Q Absolutely. 02:08:51
18 addresses; right? I know you go on to mention thermal 02:06:14	18 THE VIDEOGRAPHER: It is 2:08. We are going off 02:08:52
19 considerations, but just looking at 33, you are talking 02:06:18	19 the record. 02:08:55
20 about size? 02:06:20	20 (Recess taken.) 02:08:55
21 A Yes -- well, I discuss in paragraph 33 -- size is 02:06:20	21 THE VIDEOGRAPHER: We are back on the record. 02:19:55
22 certainly one of the parameters that has to be taken 02:06:29	22 It's 2:20. 02:20:06
23 into account to design, let's call it, efficient LiDAR 02:06:31	23 BY MR. NEWTON: 02:20:08
24 systems. 02:06:37	24 Q Dr. Lebby, you also offered an opinion in 02:20:13
25 Q You say that use of larger PCB with numerous 02:06:38	25 paragraph 35 of your declaration that it is important to 02:20:16
Page 46	Page 48
1 laser diodes would necessitate a larger LiDAR housing; 02:06:40	1 have an equal or approximately equal number of laser 02:20:18
2 is that right? 02:06:44	2 diodes per PCB to ensure an even -- even thermal load 02:20:19
3 A Well, yes, if you had larger boards, then the 02:06:44	3 across the PCBs; is that correct? 02:20:24
4 housing most likely would have to be bigger, but I can't 02:06:48	4 A Yes. 02:20:26
5 comment on that because I haven't really designed the 02:06:56	5 In paragraph 35, I'm indicating -- agreeing with 02:20:32
6 housing, and maybe there's some innovative way to -- 02:06:58	6 what Mr. Kits was saying in his declaration of making 02:20:35
7 to -- to deal with larger boards, but, generally 02:07:02	7 sure that you have a equal or uniform thermal load. 02:20:40
8 speaking, size would be an issue. 02:07:05	8 Q Is it fair to say that all -- 02:20:43
9 Q Is it fair, though, that if you had the same 02:07:08	9 (Discussion off the stenographic record.) 02:20:43
10 number of lasers and you wanted to put them on smaller 02:07:12	10 MR. NEWTON: I'll start over. 02:20:56
11 boards, you would need more boards? 02:07:15	11 Q All else being equal, is it fair to say that an 02:20:57
12 A Same number of lasers on smaller boards need more 02:07:18	12 eight-by-eight arrangement of laser diodes would have a 02:20:59
13 boards. So, yeah, that's -- hypothetically, you could 02:07:23	13 more even thermal load than a [REDACTED] 02:21:04
14 have 64 lasers on one board on one extreme. On the 02:07:26	14 arrangement of laser diodes? 02:21:06
15 other extreme, you could have 64 boards with each having 02:07:29	15 A I don't know the detailed answer to that question 02:21:07
16 one laser. 02:07:32	16 because I haven't looked at the engineering 02:21:13
17 Q So when you add more boards, your size is going 02:07:33	17 specifications for everything. 02:21:15
18 to increase in some dimension; fair? 02:07:36	18 Certainly we have to take into account the size 02:21:19
19 A Yeah, your -- if you have got 64 boards, yes, you 02:07:38	19 that is being allowed in the LiDAR to position all the 02:21:24
20 may have a size issue, but you also have -- probably 02:07:42	20 boards. I'm not clear -- it's not clear to me that 02:21:28
21 have a difficult alignment issue. Now you are aligning 02:07:45	21 there may be space for eight boards. I don't know the 02:21:30
22 64 boards as opposed to one board. That's optical 02:07:48	22 actual space -- the space availability in these designs, 02:21:34
23 alignment. 02:07:53	23 but what is really important is to make sure that you 02:21:42
24 Q And there's also a physical alignment; correct? 02:07:54	24 can fit the boards in in a reasonable size. You can 02:21:45
25 A Well, you have got -- 02:07:57	25 make sure that the design is what I would term is 02:21:52
Page 47	Page 49

1 scalable, which means you can scale it in cost, so you 02:21:55 2 don't actually increase the cost, but you can reduce the 02:21:59 3 cost. You can maintain alignment, for example, and 02:22:01 4 that's making sure you have a thermal load. 02:22:04 5 So whether that's eight or six or seven and a 02:22:07 6 half or five and a half, I don't know that answer, but I 02:22:10 7 think it's important to take into account that you want 02:22:13 8 to try and minimize your thermal load issues and your 02:22:15 9 size issues when you come to your design. 02:22:20 10 Q Okay. I'll just ask you, since we are on a clock 02:22:22 11 here and we have a limited amount of time, if you could 02:22:29 12 try to answer my questions specifically. If you can't, 02:22:32 13 of course, I understand. 02:22:34 14 But just so we are clear, my question was: All 02:22:35 15 else being equal, an eight-by-eight arrangement of laser 02:22:38 16 diodes would have a more even thermal diode than a 02:22:41 17 [REDACTED] arrangement, and with the 02:22:45 18 information, you can't give a "yes" or "no" answer to 02:22:49 19 that; is that fair? 02:22:52 20 A I can't give an answer because I don't have the 02:22:53 21 details. 02:22:57 22 When you say "everything being equal," I don't 02:22:59 23 know what "everything" is, so I can't really give you a 02:23:01 24 categorical answer there. 02:23:05 25 // 02:23:05 Page 50	1 applications. It just talks about the technology that 02:24:19 2 is used in terms of packaging semiconductor lasers. 02:24:24 3 Q And you -- I'm looking at paragraph 37 of your 02:24:27 4 declaration, which you might want to follow along with. 02:24:33 5 You specifically cite Figure 5.5 of the Liu 02:24:37 6 textbook; correct? 02:24:44 7 A Yes, I have cited that figure. 02:24:45 8 Q Okay. And this shows a semiconductor laser stack 02:24:47 9 that is composed of multiseiconductor laser bars 02:24:51 10 arranged vertically? 02:24:54 11 A That is correct; although, I would note, on 02:24:58 12 line 22 of page 9, I do not call out a laser stack of 02:25:02 13 bars, but I use the word three "boards," but I believe 02:25:07 14 that you are probably more correct. 02:25:12 15 Q Okay. "Boards" was your term, not the term from 02:25:14 16 the Liu textbook? 02:25:17 17 A "Board" was my term. 02:25:19 18 Q Okay. And laser bars, am I correct that they are 02:25:21 19 strips of multiple emitters on a common heat sink that 02:25:26 20 are all packaged together? 02:25:31 21 A Yeah. Laser bar is -- is a single piece of 02:25:32 22 semiconductor. 02:25:35 23 In this case, the laser bars are showing ten -- 02:25:36 24 ten emitters, and it would probably have ten stripes, 02:25:40 25 and they are not singulated, so they are not individual 02:25:43 Page 52
1 (Exhibit 33 was marked for 02:23:05 2 identification by the Court Reporter.) 02:23:05 3 BY MR. NEWTON: 02:23:05 4 Q Okay. I've handed you Exhibit No. 33, and this 02:23:06 5 was Exhibit 4 to your declaration. It's a textbook 02:23:15 6 authored by Xingsheng Liu; is that correct? 02:23:18 7 And I should mention this is an excerpt from the 02:23:22 8 textbook. 02:23:25 9 A Yes, it is. 02:23:25 10 Q The title of the textbook is "Packaging of High 02:23:26 11 Power Semiconductor Lasers"? 02:23:29 12 A That is correct. 02:23:30 13 Q What does "packaging" refer to in that title? 02:23:31 14 A "Packaging" is usually the process of making 02:23:38 15 outside connections to a semiconductor chip. It doesn't 02:23:43 16 have to be a semiconductor chip, but it's usually 02:23:51 17 something that emits or detects light in this case. 02:23:53 18 Packaging usually allows both optical and electrical 02:23:56 19 connections to the outside world. 02:23:59 20 Q Okay. And this textbook is not specific to 02:24:01 21 LiDAR; is that correct? 02:24:03 22 A That is correct. 02:24:04 23 Q And the textbook does not describe any specific 02:24:05 24 LiDAR applications; is that correct? 02:24:11 25 A I don't believe the textbook discusses LiDAR 02:24:12 Page 51	1 lasers. 02:25:46 2 Q And the LiDAR systems that we have talked about 02:25:47 3 in this case use singulated emitters; correct? 02:25:50 4 A Yes. They use singulated emitters. 02:25:55 5 I think I saw, in one of the documents, that the 02:26:00 6 emitter is composed of [REDACTED] laser-emitting chips. I 02:26:05 7 haven't seen, in detail, what they look like, but this 02:26:11 8 example here just shows you that you could have a laser 02:26:14 9 bar with ten laser diode outputs. 02:26:17 10 Q You agree with me that Figure 5 is -- is it fair 02:26:20 11 to say it's kind of a crude representation of the laser 02:26:38 12 stack -- laser bar stack? 02:26:41 13 A When you say "crude," yeah, there's not a lot of 02:26:42 14 details in Figure 5.5. It just shows three substrates 02:26:48 15 mounted on top of each other with laser bars mounted on 02:26:52 16 the substrate and the -- what would look like the 02:26:55 17 emitted laser beam from each of the output emitters. 02:26:59 18 Q And do you agree that the number of emitters on a 02:27:03 19 semiconductor laser bar range from 19 to 69, typically? 02:27:06 20 A The number of emitters on a laser bar range from 02:27:12 21 19 to 69. I'm not sure I understand the question. 02:27:24 22 Q So a laser bar typically has a number of laser 02:27:27 23 emitters on it; correct? 02:27:32 24 A Yes. 02:27:34 25 Q Not just one, but multiple? 02:27:35 Page 53

1 A Multiple, yes. 02:27:37	1 but there are other examples in the literature which 02:30:34
2 Q And that number is typically 19 to 69? 02:27:37	2 show differences from this. 02:30:38
3 A I -- no. I would disagree, because the laser bar 02:27:42	3 Q You didn't cite any of those examples in your 02:30:39
4 is generally referred to as a plurality of lasers, so 02:27:45	4 declaration, did you? 02:30:41
5 it's more than one laser output, so I would say that it 02:27:49	5 A That is correct. 02:30:42
6 will be two and above, and I've seen laser bars with two 02:27:52	6 Q And then Figure 5.5 -- so the fast axis is the 02:30:43
7 lasers, three lasers, four lasers, all the way up to a 02:27:56	7 vertical access -- axis of each beam? 02:30:46
8 few hundred lasers. 02:28:00	8 A That is correct. 02:30:50
9 Q So if you go to page 110 of the Liu textbook, 02:28:01	9 Q And in the Figure 5.5, all of those fast axes are 02:30:50
10 Section 5.1.2? 02:28:06	10 in planes that are parallel to each other? 02:31:00
11 A Section 5.1, yes, I see it. 02:28:14	11 A Yes, I say that's correct, from what I can see in 02:31:04
12 Q And do you see where it says: A semiconductor 02:28:18	12 the figure. 02:31:09
13 laser bar is composed by multiple emitters arranged in a 02:28:21	13 Q And you didn't cite any examples of laser bars 02:31:09
14 row as shown in Figure 5.3. The emitter numbers of a 02:28:24	14 where the fast axis planes would be intersecting with 02:31:13
15 semiconductor laser bar range from 19 to 69 with 02:28:34	15 each other? 02:31:16
16 different fill factors. 02:28:37	16 A No, I did not. 02:31:16
17 Do you see that? 02:28:39	17 Q And if you go to Figure 5.3 of the Liu textbook 02:31:17
18 A Yes, I see what has been written. 02:28:39	18 on the previous page, this identifies a heat sink? 02:31:27
19 Q Is that different from your understanding of what 02:28:43	19 A Oh, yes, it's on 5.3. I see it. 02:31:38
20 a laser bar is? 02:28:45	20 Q Those heat sinks are typically metal blocks that 02:31:41
21 A Yes. 02:28:46	21 the laser diode bar is positioned on top of? 02:31:53
22 I don't know if this author is referring to 02:28:49	22 A In some cases, yes. 02:31:58
23 Reference No. 9. I certainly haven't looked at 02:28:51	23 In high-power lasers, the heat sink can -- can 02:32:02
24 Reference 9, but a laser bar is more than one laser 02:28:54	24 well be a couple block. Most diode lasers have ceramic 02:32:05
25 because, otherwise, that's how you define a bar. And I 02:28:59	25 heat sinks. I've seen lasers with, for example, silicon 02:32:11
Page 54	Page 56
1 I think this author may be talking about a particular 02:29:04	1 heat sinks, so there's various materials that can be 02:32:15
2 example, but, in my experience, a laser bar would have 02:29:06	2 used. 02:32:17
3 two to n lasers outputs. 02:29:10	3 Q Is metal the most common heat sink material, in 02:32:17
4 Q And regardless of how many emitters are on the 02:29:14	4 your experience? 02:32:20
5 laser bar, do you agree with me that they are typically 02:29:17	5 A It depends. It's definitely an answer depends on 02:32:20
6 all on oriented the same direction? 02:29:20	6 the performance of the laser. 02:32:24
7 A When you say "oriented," can I further understand 02:29:22	7 In the lasers that this book is talking about, in 02:32:25
8 what you are trying to say? 02:29:28	8 this chapter, these are high-power lasers. I would say 02:32:28
9 Q Sure. 02:29:30	9 a combination of metal and ceramic is probably popular. 02:32:31
10 If the emitters are all mounted in the same 02:29:30	10 (Exhibit 34 was marked for 02:32:31
11 plane, then they are all pointing in the same direction 02:29:39	11 identification by the Court Reporter.) 02:32:31
12 perpendicular to that plane? 02:29:42	12 BY MR. NEWTON: 02:32:31
13 A I've seen cases where that's not the case. 02:29:45	13 Q Can you go to Exhibit 34, which I've also put in 02:32:37
14 Typically, that is the case, but you can do 02:29:49	14 front of you, and do you recognize this as a 02:32:40
15 things in laser bars to change the output spot. 02:29:52	15 dissertation that you cited in your declaration? 02:32:47
16 What we are looking at here in Figure 5.5 is fast 02:29:57	16 A That is correct. 02:32:49
17 axis output where the vertical is the fast axis, which 02:30:02	17 Q And, again, this is excerpts of the dissertation. 02:32:50
18 is the -- yes, the vertical. It's the narrow part of 02:30:05	18 And if you go to page 16 of Exhibit 34, and 02:32:54
19 the beam and the white part of the beam. The fill axis 02:30:11	19 Figure 2.6 shows two examples of heat sinks used for 02:33:06
20 is the horizontal. 02:30:16	20 laser diode bars; is that correct? 02:33:12
21 I've seen situations where the lasers can be 02:30:18	21 A Yes. This shows two copper heat sinks for 02:33:13
22 variably spaced. They can be spaced in parallel, 02:30:21	22 high-power lasers. 02:33:21
23 equally spaced, and I've seen it where the upper beam 02:30:24	23 Q Okay. So if you go to paragraph 46 of your 02:33:23
24 has been modified by the fabrication techniques. 02:30:28	24 declaration, back on Exhibit 30 -- and this part of your 02:33:50
25 So although this is a -- a example in the book, 02:30:31	25 declaration is discussing Waymo trade secrets related to 02:34:06
Page 55	Page 57

1 [REDACTED]? 02:34:10	1 A Oh, Figure 7.51 [sic]? 02:37:28
2 A I see that. 02:34:12	2 Q Yes. 02:37:30
3 Q Am I correct that you do not dispute that the 02:34:13	3 A Yes, I've got that in front of me. 02:37:31
4 Fuji device includes a transmit block with a plurality 02:34:18	4 Q And Liu also includes a Figure 7.5.0? 02:37:33
5 of laser diodes mounted on [REDACTED] with [REDACTED] 02:34:21	5 A That is correct. 02:37:36
6 [REDACTED] 02:34:27	6 Q And that's not cited in your declaration? I 02:37:37
7 A So I have heard this from Mr. Haslim in my 02:34:30	7 should say, the figure itself is not included in your 02:37:47
8 video-call discussion with him, because I asked him the 02:34:37	8 declaration? 02:37:49
9 question, though I have not actually seen a board or a 02:34:39	9 A Yeah, I think I just cited the Liu textbook 02:37:49
10 laser package in -- in real life, only from a 02:34:42	10 page 224. 02:37:53
11 photograph, which I've used in my document, and the 02:34:47	11 Q You don't discuss Figure 7.5.0 in your 02:37:54
12 resolution of which is -- doesn't allow me to take a 02:34:50	12 declaration? 02:37:57
13 close look at the situation. 02:34:53	13 A That is correct. 02:37:57
14 Q So you did not offer an opinion as to whether 02:34:54	14 Q And figure -- page 224 of the Liu textbook, along 02:38:01
15 this design is present or not in the Fuji device? 02:34:58	15 with Figure 7.5.0 and 7.5.1, this material is not in the 02:38:13
16 A It's my understanding that the laser diodes used 02:35:02	16 context of LiDAR; correct? 02:38:19
17 in the Fuji system are [REDACTED] from my discussion with 02:35:08	17 A Well, what we are looking at here is the 02:38:20
18 Mr. Haslim. 02:35:12	18 placement of laser diodes. 02:38:26
19 Q Did he tell you [REDACTED] 02:35:12	19 Q So my question, Dr. Lebby, was just: Is it in 02:38:28
20 A I believe he may have said [REDACTED] but 02:35:14	20 the context of LiDAR specifically? 02:38:31
21 I can't be quoted on that because that number did come 02:35:22	21 A Well, this is in the context of packaging laser 02:38:33
22 up, and I wasn't sure if it related to [REDACTED] 02:35:26	22 diodes in high-power environment, and LiDAR uses 02:38:37
23 [REDACTED] 02:35:30	23 high-power laser diodes, so I would agree with you that 02:38:41
24 Q Is it correct that the only LiDAR devices with 02:35:33	24 LiDAR is not noted in the book, but I have to observe 02:38:46
25 [REDACTED] that are identified in your 02:35:37	25 that LiDAR uses high-power laser diodes in a similar 02:38:50
Page 58	Page 60
1 declaration are Waymo's devices and the Uber Fuji 02:35:40	1 fashion. 02:38:54
2 device? 02:35:44	2 Q So page 224 of the Liu textbook, you would agree, 02:38:55
3 A Well, I haven't done a industrial review of LiDAR 02:35:44	3 is not discussing LiDAR specifically; is that fair? 02:39:02
4 devices, so what I can say is that, from the documents 02:35:52	4 A Well, it's -- it's discussing -- it's discussing 02:39:05
5 I've read, the Waymo device uses [REDACTED] and on 02:35:57	5 the packaging of high-power semiconductor lasers are 02:39:09
6 the Fuji device, from what I've been told -- and I 02:36:03	6 used in LiDAR, but it does not, agree with you, call out 02:39:12
7 haven't actually seen the board in detail -- that Fuji 02:36:06	7 LiDAR specifically. 02:39:17
8 device also uses [REDACTED] diodes. I don't know if any 02:36:09	8 Q It doesn't say use these designs in a LiDAR 02:39:17
9 other laser -- LiDAR unit uses [REDACTED] at this 02:36:13	9 system? 02:39:20
10 point. 02:36:18	10 A This book -- the context of this book is -- is 02:39:20
11 Q So you didn't identify any others besides the 02:36:18	11 the packaging of the lasers, not the applications, so I 02:39:24
12 Waymo and Fuji device in your declaration? 02:36:21	12 would agree with you that LiDAR is not called out or 02:39:28
13 A I didn't identify any others because I haven't 02:36:22	13 mentioned. 02:39:30
14 done analysis. 02:36:27	14 Q And I believe you say that a known disadvantage 02:39:31
15 Q Paragraph 49 of your declaration, you cite the 02:36:28	15 of [REDACTED] is an effective heat 02:39:36
16 Liu textbook again; is that correct? 02:36:37	16 conduction; correct? 02:39:41
17 A Yes. 02:36:39	17 A That is correct. 02:39:41
18 Q Okay. And I believe you cite page 224 of the Liu 02:36:41	18 Q And you agree with me that heat conduction and 02:39:42
19 textbook? 02:36:57	19 other thermal considerations are important for 02:39:46
20 A Yes, I have it in front of me. 02:36:58	20 high-powered laser diode applications? 02:39:48
21 Q And your declaration at paragraph 49 includes 02:37:00	21 A I would go further to say that heat conduction is 02:39:50
22 Figure 7.5.1 from Liu; correct? 02:37:09	22 important for all semiconductor diode lasers. 02:39:54
23 A Could you tell me where you get 7.5.1? 02:37:12	23 Q And then the -- I believe you also said the 02:39:56
24 Q You might have to cross-reference it with the -- 02:37:22	24 downside of underhanging laser diodes is potential 02:40:00
25 the Liu text itself. 02:37:25	25 blockage of emitted light? 02:40:03
Page 59	Page 61

1 A If I remember correctly, my understanding of the 02:46:37	1 note, that I did not cite in my report because I 02:49:53
2 trade secret is [REDACTED] 02:46:41	2 forgot -- let's see. The -- from line -- column 3, 02:49:57
3 [REDACTED] 02:46:45	3 line 10 to 16 talks about the alignment of photodiodes 02:50:05
4 [REDACTED]. 02:46:50	4 towards the hole. I can read it if you wish. 02:50:11
5 Q So it's your understanding of the trade secret 02:46:54	5 Q No, that's okay. 02:50:13
6 [REDACTED] 02:46:56	6 Did you understand my question? 02:50:14
7 [REDACTED] 02:47:01	7 A Well, your question is, is the patent is -- 02:50:17
8 [REDACTED] 02:47:06	8 teaches [REDACTED] and what I'm 02:50:20
9 A No. No. That's not exactly what I'm trying to 02:47:08	9 suggesting is that the patent, if you look at column 3, 02:50:23
10 say. 02:47:11	10 actually does more than that. It actually teaches the 02:50:26
11 What I'm trying to say is you have two parts to 02:47:11	11 [REDACTED] 02:50:30
12 this trade secret, is the best of my understanding. The 02:47:14	12 [REDACTED] 02:50:35
13 first part is [REDACTED] 02:47:17	13 [REDACTED] 02:50:38
14 [REDACTED] is 02:47:23	14 MR. NEWTON: I'll move to strike that response as 02:50:41
15 the first part. And the second part is -- [REDACTED] 02:47:28	15 nonresponsive and outside the scope of your declaration. 02:50:44
16 [REDACTED] 02:47:33	16 Q My question was simply that this patent does not 02:50:47
17 [REDACTED] 02:47:36	17 deal with [REDACTED] 02:50:51
18 Q And do you agree that the trade secret also 02:47:36	18 [REDACTED] It's just a single printed circuit board; 02:50:53
19 includes the [REDACTED] 02:47:39	19 correct? 02:50:56
20 A I'm not sure I understand that -- that question, 02:47:42	20 A I believe there are two boards that are aligned 02:50:56
21 other than the fact that [REDACTED] 02:47:57	21 together here, and I believe that this patent teaches 02:51:00
22 [REDACTED] 02:48:01	22 the alignment of photodiodes to the board using the pin 02:51:05
23 [REDACTED] 02:48:05	23 as the source. 02:51:08
24 [REDACTED] 02:48:09	24 MR. NEWTON: Okay. I'll move to strike that as 02:51:11
25 [REDACTED] 02:48:14	25 well. 02:51:13
Page 66	Page 68
1 Q Okay. In paragraph 53, you say: The concept of 02:48:14	1 Q If you look at Figure 3, that shows just a single 02:51:13
2 [REDACTED] has been 02:48:22	2 printed circuit board; correct, labeled 10? 02:51:16
3 known to the public since at least the 1970s, and you 02:48:24	3 A Figure 3 shows a number of things here. 02:51:23
4 cite U.S. Patent No. 4,244,109? 02:48:28	4 No. 10 -- 02:51:46
5 A Yes, I do. 02:48:33	5 Q Dr. Lebby, I'm sorry, just, again, in the 02:51:46
6 Q I've marked that patent as Exhibit No. 35, which 02:48:33	6 interest of time, if you could answer my question as 02:51:49
7 is in front of you. 02:48:38	7 I've asked it, and I don't think the question was 02:51:51
8 (Exhibit 35 was marked for 02:48:40	8 complicated. 02:51:54
9 identification by the Court Reporter.) 02:48:49	9 I just said, if you look at Figure 3, it shows a 02:51:54
10 BY MR. NEWTON: 02:48:49	10 single printed circuit board labeled No. 10; correct? 02:51:57
11 Q And the '109 patent is directed to a read/write 02:48:51	11 A Figure 3 shows a printed circuit board 10, plus a 02:51:59
12 head and a magnetic disk data storage system. 02:48:57	12 alignment of a plate, which is aligned to the printed 02:52:04
13 Does that sound correct? 02:49:01	13 circuit board, which I'm looking for the number and I 02:52:07
14 A Yes. In the "Background of the Invention," the 02:49:02	14 can't find it. 02:52:09
15 '109 patent does talk about that as the application. 02:49:04	15 Q Okay. So you agree that Figure 3 shows only one 02:52:10
16 Q So it's not in the field of LiDAR? 02:49:07	16 printed circuit board, "yes" or "no"? 02:52:13
17 A I would agree that the patent is written towards 02:49:12	17 A Let me just check what No. 14 is. 02:52:17
18 optical storage. 02:49:15	18 It certainly looks like Figure 3 has one printed 02:52:35
19 Q And the '109 patent does not deal with [REDACTED] 02:49:16	19 circuit board labeled 10. 02:52:38
20 [REDACTED] correct? 02:49:25	20 Q And paragraph 53 of your declaration does not 02:52:39
21 A If you look at the sections I've cited in 02:49:26	21 describe more than one printed circuit board; correct? 02:52:52
22 column 1 -- 189, that talks about the aligning of the 02:49:32	22 A Paragraph 53 discusses the concept of using holes 02:52:55
23 printed circuit board, and 163 talks about having a 02:49:38	23 to align printed circuit boards, and I've just given you 02:53:05
24 cylindrical pin for the alignment. 02:49:47	24 one patent, which is patent '109, that shows that you 02:53:07
25 But if you also look at column 3, which, I might 02:49:50	25 can align components on a printed circuit board that's 02:53:12
Page 67	Page 69

<p>1 actually sourced to a pin to do it -- to align the board 02:53:14 2 to a glass plate, and there was a glass plate and a 02:53:17 3 board, and the components were all aligned based to the 02:53:23 4 pin. 02:53:25 5 Q Okay. So in your description of the '109 patent 02:53:25 6 in paragraph 53, you only mention the one PCB that's 02:53:28 7 disclosed in that patent; correct? 02:53:31 8 A Yes, that's correct. 02:53:32 9 Q And paragraph 54 of your declaration cites a 02:53:51 10 German patent from 1980? 02:53:55 11 A That is correct. 02:53:58 12 Q It's actually a patent application; correct? 02:53:59 13 A I take it that's Exhibit 36? 02:54:05 14 Q That's correct. Exhibit 36 was Exhibit 7 to your 02:54:13 15 declaration, I believe. 02:54:18 16 (Exhibit 36 was marked for 02:54:20 17 identification by the Court Reporter.) 02:54:21 18 THE WITNESS: I'm not sure if it's patent 02:54:21 19 application or not, but certainly it's a German patent, 02:54:25 20 and I've cited the abstract of this patent. 02:54:30 21 BY MR. NEWTON: 02:54:32 22 Q And the version of it that you have attached to 02:54:37 23 your declaration is -- looks like an English 02:54:39 24 translation; correct? 02:54:41 25 A Yes, I believe there's English and German. 02:54:42 Page 70</p>	<p>1 abstract to say that [REDACTED] 02:56:22 2 [REDACTED] 02:56:25 3 A Well, you talk about [REDACTED] 02:56:26 4 [REDACTED] 02:56:29 5 [REDACTED] 02:56:33 6 Q So it's your opinion that this patent discloses 02:56:34 7 [REDACTED] 02:56:38 8 [REDACTED] 02:56:42 9 [REDACTED] 02:56:44 10 A It's my understanding this patent teaches that 02:56:44 11 [REDACTED] 02:56:49 12 [REDACTED] 02:56:51 13 Q And that's the -- 02:56:54 14 A I believe the patent doesn't talk about the stack 02:56:55 15 per se, but it talks about the process of putting a 02:57:00 16 reference hole or an accurately located hole into 02:57:03 17 printed board so that [REDACTED] 02:57:06 18 [REDACTED] 02:57:09 19 Q Okay. And, again, you didn't cite the figures 02:57:09 20 from this patent as part of your declaration? 02:57:13 21 A I didn't cite the figures because I haven't seen 02:57:16 22 the figures and I couldn't find the figures. 02:57:18 23 Q You looked for them? 02:57:20 24 A I tried. 02:57:21 25 Q And it's not your opinion that this German patent 02:57:22 Page 72</p>
<p>1 Q Doesn't have any figures in it, does it? 02:54:45 2 A That is correct. 02:54:47 3 Q And in paragraph 54, you describe the German 02:54:48 4 patent as describing board holes that all have an exact 02:55:00 5 relative position to one another; correct? 02:55:05 6 A Correct. 02:55:07 7 Q And the board holes are not [REDACTED] 02:55:08 8 [REDACTED] correct? 02:55:15 9 A That I'm not sure about, because the abstract 02:55:16 10 talks about boards in a stack, so I would presume that 02:55:25 11 these are boards aligned in a stack using a reference 02:55:29 12 hole to align those boards. 02:55:33 13 Q But the abstract also discusses the board holes 02:55:34 14 as being positioned over a salter boss [phonetic]; 02:55:38 15 correct? 02:55:42 16 A That is correct. 02:55:42 17 Q So if each hole is positioned over a salter boss, 02:55:53 18 then the holes are not going to be positioned over each 02:56:03 19 other? 02:56:06 20 A Well, the design of the patent is to certainly 02:56:06 21 make holes in the printed circuit board so they could be 02:56:08 22 used in a stack minus, then, in a stack is a stack of 02:56:11 23 printed circuit boards that are aligned to the holes. 02:56:16 24 Q Right. 02:56:18 25 But there's not enough description in that 02:56:19 Page 71</p>	<p>1 is in the field of LiDAR; correct? 02:57:31 2 A Well, the patent doesn't teach the use of these 02:57:33 3 boards in LiDAR, but boards, as we know, are used in 02:57:39 4 LiDAR, so -- but it doesn't explicitly talk about LiDAR. 02:57:43 5 It talks about printed circuit boards. 02:57:46 6 Q And the portion of the -- or, I should say, the 02:57:48 7 German patent, it's not your opinion that it describes 02:57:53 8 [REDACTED] 02:57:56 9 [REDACTED] 02:57:59 10 A It's my understanding this patent doesn't discuss 02:58:00 11 [REDACTED]. 02:58:04 12 Q Does it discuss [REDACTED] 02:58:09 13 A Just give me 30 seconds. 02:58:12 14 I believe [REDACTED] are not mentioned in this patent. 02:59:22 15 MR. NEWTON: Okay. Can we take a break real 02:59:24 16 quick? 02:59:26 17 THE VIDEOGRAPHER: Yeah. I've got to change the 02:59:27 18 disc, so -- 02:59:27 19 MR. NEWTON: Okay. 02:59:27 20 THE VIDEOGRAPHER: -- that will work out. 02:59:27 21 This is the end of Disc 1 in Volume 1 in the 02:59:29 22 deposition of Dr. Lebby. It is 2:59. 02:59:31 23 (Recess taken.) 02:59:35 24 THE VIDEOGRAPHER: We are back on the record. 03:05:16 25 This is the beginning of Disc 2 in Volume 1 in 03:05:27 Page 73</p>

1 the deposition of Dr. Lebby. It's 3:05. 03:05:31
2 (Exhibit 37 was marked for 03:05:31
3 identification by the Court Reporter.) 03:05:33
4 BY MR. NEWTON: 03:05:33
5 Q Okay. Dr. Lebby, if you go to Exhibit No. 37, 03:05:34
6 Deposition Exhibit No. 37, which is Exhibit No. 8 to 03:05:38
7 your declaration. 03:05:42
8 Do you recognize this as the '037 patent? 03:05:44
9 A Yes, I recognize it. 03:05:46
10 Q And this is directed to a multilayer printed 03:05:47
11 circuit board? 03:05:50
12 A That is correct. 03:05:51
13 Q And that's just a single printed circuit board, 03:05:51
14 not multiple printed circuit boards? 03:05:55
15 A I believe this is a single printed circuit board. 03:05:56
16 Q And this is -- patent is not in the field of 03:06:01
17 LiDAR; correct? 03:06:05
18 A The patent doesn't mention LiDAR at all. It just 03:06:05
19 talks about the process to drill holes into a printed 03:06:15
20 circuit board and position hidden conductive layers. 03:06:18
21 Q Okay. And it doesn't talk about [REDACTED] 03:06:22
22 [REDACTED] [REDACTED] [REDACTED] [REDACTED] 03:06:25
23 [REDACTED] correct? 03:06:29
24 A That's my understanding of this patent. Doesn't 03:06:30
25 discuss [REDACTED] [REDACTED] [REDACTED] [REDACTED] 03:06:33
Page 74

1 [REDACTED] 03:06:37
2 [REDACTED] 03:06:41
3 but they are not directly called out in this patent. 03:06:44
4 Q And so we have looked at the Liu textbook, the 03:06:47
5 Scholz dissertation, the '109 patent, the German patent, 03:06:54
6 and the '037 patent, and you haven't cited any evidence 03:06:59
7 in your declaration that someone has actually taken the 03:07:04
8 teachings of these references and applied them to LiDAR; 03:07:07
9 correct? And I'm just asking what you have cited in 03:07:13
10 your declaration. 03:07:15
11 A Yeah, what I've cited in my declaration is 03:07:16
12 technologies that are common to myself as an experienced 03:07:20
13 person in the field where -- 03:07:24
14 Q And, I'm sorry, Dr. Lebby, to cut you off, I'm 03:07:27
15 just really under the clock here. 03:07:29
16 I just -- if you can answer them "yes" or "no," 03:07:31
17 you don't cite any evidence in your declaration of 03:07:33
18 someone taking these references and applying their 03:07:35
19 teachings to LiDAR? 03:07:38
20 A I have not observed any of these references 03:07:40
21 directly, either being taught or mentioned in LiDAR, but 03:07:44
22 the technologies within these references are certainly 03:07:49
23 something that could be used in LiDAR. 03:07:52
24 Q Okay. And it's not your opinion that Uber took 03:07:53
25 these references and used them as a guide to develop its 03:07:57
Page 75

1 LiDAR system; correct? 03:08:02
2 A I cited these references to show that industry 03:08:03
3 technology is out there and in public that addresses 03:08:07
4 some of the trade secrets that I read in the Jaffe 03:08:12
5 Exhibit 1 document. 03:08:17
6 Q You did not cite them to show that Uber used 03:08:17
7 these references or these teachings to develop its 03:08:20
8 system; correct? 03:08:23
9 A These references were cited to show 03:08:24
10 state-of-the-art in technology of printed circuit boards 03:08:28
11 and -- and recent placement in alignment, things like 03:08:32
12 [REDACTED] That -- that's the only reason I cited them. 03:08:35
13 Q Okay. So the answer to my question is "correct"? 03:08:39
14 A I did not use these references to show anything 03:08:44
15 about Uber, just where the technology is in the -- from 03:08:47
16 an experienced engineer. 03:08:53
17 Q Okay. If you go to paragraph 59 of your 03:08:54
18 declaration here, you discuss Trade Secret Nos. 94 to 03:08:58
19 99? 03:09:08
20 A Yes, I see that. 03:09:08
21 Q And these trade secret numbers refer to the PCB 03:09:12
22 design schematics and layouts for the transmit boards in 03:09:20
23 Waymo's GBR3 LiDAR device? 03:09:24
24 A That is correct. 03:09:26
25 Q And we talked earlier about your materials 03:09:27
Page 76

1 considered. 03:09:29
2 You didn't consider these specific design files 03:09:29
3 as part of your declaration; correct? 03:09:31
4 A I only considered what was shown to me in the 03:09:33
5 exhibits, and I think they were the Jaffe exhibits. 03:09:38
6 Q Okay. You didn't look at the native versions of 03:09:41
7 the design files, for example? 03:09:45
8 A That is correct. 03:09:46
9 Q And you didn't offer an opinion about whether 03:09:46
10 these files themselves are trade secrets; correct? 03:09:56
11 A I never looked. It wasn't part of my remit to 03:09:59
12 look at native files, so I haven't offered any opinions. 03:10:04
13 Q And do you agree with me, generally, that, you 03:10:08
14 know, based on your experience that a company's design 03:10:12
15 files can be trade secrets and include trade secret 03:10:15
16 information? 03:10:19
17 A It depends. 03:10:19
18 Also, from my experience with trade secrets is 03:10:24
19 that you have got to have very clear specificity of your 03:10:27
20 trade secret. I guess it could be in -- trade design 03:10:31
21 files could be included in that. 03:10:35
22 Q And you understand, as part of this case, Waymo 03:10:36
23 has alleged that Anthony Levandowski stole 14,000 files 03:10:42
24 related to Waymo's LiDAR systems? 03:10:47
25 A I have certainly read that in some of the 03:10:50
Page 77